CLAIMS:

1. A method of determining a compensation signal for the compensation of a temporally varying field strength of the main magnetic field of a main magnet of a magnetic resonance imaging device which also includes at least one gradient field coil for generating a gradient magnetic field and a magnetizable material which interacts with the magnetic fields of the device, characterized in that at least one quantity which is characteristic of the temperature-dependent magnetic properties of the magnetizable material is determined, the compensation signal being provided on the basis of said quantity.

2. A method as claimed in Claim 1, characterized in that the electric signal applied to the gradient magnetic field coil, or each gradient magnetic field coil, is determined as the characteristic quantity.

3. A method as claimed in one or more of the preceding Claims, characterized in that the temperature of the magnetizable material is measured as the characteristic quantity.

4. A method as claimed in one or more of the preceding Claims, wherein the main magnet includes a main magnetic field coil having a resistance which is not negligibly small with a view to power dissipation, characterized in that a further quantity which is characteristic of the temperature-dependent magnetic properties of the magnetizable material is determined from the electric power dissipated in the main magnetic field coil.

5. A method as claimed in one or more of the preceding Claims, characterized in that the compensation signal is determined on the basis of a predetermined functional relationship between the temperature-dependent magnetic properties of the magnetizable material and the relevant characteristic quantity or each relevant characteristic quantity.

6. A method as claimed in Claim 5, characterized in that the relevant functional relationship is taken up in a look-up table, the input parameter of which is a representation of

the characteristic quantity or each characteristic quantity whereas its output parameter is a representation of the compensation signal.

7. A method as claimed in one or more of the preceding Claims, wherein the device includes an auxiliary magnetic field coil for the compensation of the field strength of the main magnetic field, characterized in that the main magnetic field is compensated by generating an auxiliary magnetic field by means of the auxiliary magnetic field coil in conformity with the compensation signal determined.

8. A method as claimed in one or more of the preceding Claims, wherein the main magnet includes a main magnetic field coil having a resistance which is not negligibly small with a view to power dissipation, characterized in that the main magnetic field is compensated by controlling the electrical energizing of the main magnetic field coil in conformity with the compensation signal determined.

9. A method as claimed in one or more of the preceding Claims, wherein the device includes high-frequency (RF) oscillator means for energizing at least one high-frequency (RF) coil, characterized in that during operation the frequency of the RF oscillator means is adapted in conformity with the compensation signal determined.

10. A method as claimed in Claim 9, characterized in that the frequency of the RF oscillator means is adapted prior to the application of one or more gradient magnetic field signals.

11. A method as claimed in one or more of the preceding Claims, wherein the device includes processor-controlled processing means for the processing of an information signal acquired under the influence of the main magnetic field, characterized in that in order to provide a compensated information signal the processing means are controlled in conformity with the compensation signal determined.

12. A method as claimed in one or more of the preceding Claims, characterized in that variations of the field strength of the main magnetic field are determined and compensated, if necessary, one or more times during an acquisition period.

13. A method as claimed in one or more of the preceding Claims, characterized in that the compensation signal is also determined by measurement of variations of the field strength of the main magnetic field which are caused by one or more further quantities, including external magnetic fields, atmospheric pressure and mechanical vibrations, the degree of compensation being determined from a relevant functional relationship which represents the effect of the relevant quantity on the main magnetic field.

14. A device for magnetic resonance imaging, including a receiving space for accommodating an object to be imaged, a main magnet for generating a main magnetic field in the receiving space, at least one gradient field coil and at least one high-frequency (RF) coil, energizing and control means for energizing and controlling the main magnet, the gradient field coil and the RF coil, and processing means which are actively coupled to the energizing and control means in order to determine a compensation signal for the compensation of a temporally varying field strength of the main magnetic field, characterized in that the processing means are arranged to carry out the method claimed in one or more of the preceding Claims.